GCE AS/A LEVEL

2520U20-1

Z22-2520U20-1

THURSDAY, 26 MAY 2022 – MORNING

ECONOMICS – AS unit 2
Economics in Action

2 hours

2520U201
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ADDITIONAL MATERIALS

In addition to this examination paper, you will need:

- a calculator;
- a WJEC pink 16-page answer booklet.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.
You may use a pencil for graphs and diagrams only.
Answer **all** questions.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question.
You are reminded of the necessity for good English and orderly presentation in your answers.

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Answer **all** the questions.

1. SALMON FARMING IN SCOTLAND

It is predicted that, by 2050, the world's population will reach 9.7 billion and the demand for protein will double, leading to food scarcity. Fish, particularly farmed salmon, can offer one solution to meeting this increased demand.

> Farmed salmon is bred in controlled conditions for the food industry. Wild salmon is caught in its natural habitat.

In addition to the growing world population, the demand for salmon is increasing as people are actively encouraged to consume more fish as part of a healthy and balanced diet. Farmed salmon is a good source of high-quality protein, vitamins and minerals.

Consumers typically increase their spending on animal proteins such as salmon as their income increases. An improving global economy has therefore further increased demand. This has pushed prices upwards, despite total supply continuing to rise.

The Global Salmon Initiative argues that farmed salmon is also a highly efficient source of protein production and a positive contributor to local communities. Salmon farming is one of Scotland's most profitable industries: it currently provides over 12 000 jobs across the country and farmed Scottish salmon is the UK's biggest single food export.

Environmental impact of animal protein production

	salmon	chicken	pork	beef
				
Water Consumption (litre / kg edible meat)	2 000	4 300	6 000	15 400
Carbon Footprint (grams CO_2-equivalent / typical serving of 40 g edible protein)	0.6	0.9	1.3	5.9

Improved productivity within the salmon farming industry should mean that the supply of farmed salmon is price responsive. However, in the short run, supply is limited by the 3-year production process, regulations, and capacity constraints.

In recent years, environmentalists across the world have been campaigning for the closure of fish farms, including those in Scotland, whose presence has been blamed for the decrease in wild salmon stocks.

A Scottish marine activist said: "Diseases are common in salmon farms and no research has been done to determine the effects on wild populations. Another major problem associated with salmon farming is sea lice, which spread disease and can be passed on to wild animals.

"Farmed salmon eat fish caught in the wild. Some sources say that it takes as much as 5 kg of wild fish to produce 1 kg of farmed salmon, meaning that thousands of tonnes of wild fish are being wasted."

In 2018, the Scottish Environment Protection Agency said almost one in five salmon farms in Scotland failed to meet statutory environmental standards, and a report by the Scottish Government's environment committee said that water-based (marine) ecosystems faced irrecoverable damage if concerns were not addressed.

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(a) Using an example from the data, describe what is meant by the term 'scarcity' (line 2). [2]

(b) Outline whether salmon is a normal or an inferior good. [2]

(c) With reference to lines 6–11, explain why salmon prices have risen. Use a supply and demand diagram in your answer. [6]

(d) Consider whether the supply of farmed salmon is price inelastic or price elastic. [6]

(e) To what extent does salmon farming in Scotland lead to market failure? [12]

(f) Discuss the likely impacts on the Scottish economy of the closure of all salmon farms. [12]

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2. INTERESTING INTEREST RATES

On 1 August 2018, the UK's Monetary Policy Committee (MPC) voted unanimously to raise its interest rate by 0.25 percentage points to 0.75%, the highest level for more than nine years. It led the Daily Mirror newspaper to run the headline "Bank of England raises interest rates by 50%" which was technically true but a little misleading.

Savings specialist Calum Bennie said: "While it's potentially good news for savers, it could be disastrous for borrowers – adding hundreds of pounds to their bills … households must be even more sensible to absorb the additional cost."

Savers: Someone with a £5 000 savings balance benefiting from a 0.25 percentage point rate increase will see their interest income rise by £1.04 per month.

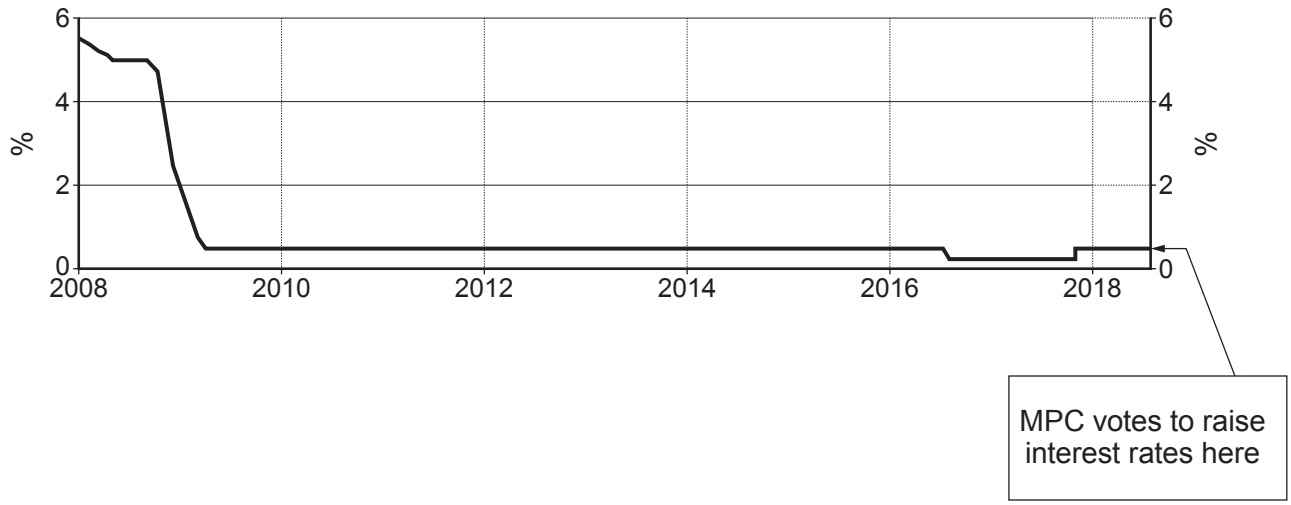
Borrowers: 3 million UK borrowers have a 'tracker mortgage'. The new interest rate will add significantly to households' monthly mortgage repayments as shown in **Table 1**.

Tracker Mortgage: the monthly repayment of the mortgage moves up and down depending on the Bank of England's bank rate.

Table 1

Total mortgage	Extra monthly repayment (assuming 20 years left to run)
£130 000	£16
£200 000	£26
£250 000	£34

Figure 1: Bank of England's bank rate from 2008 to August 2018

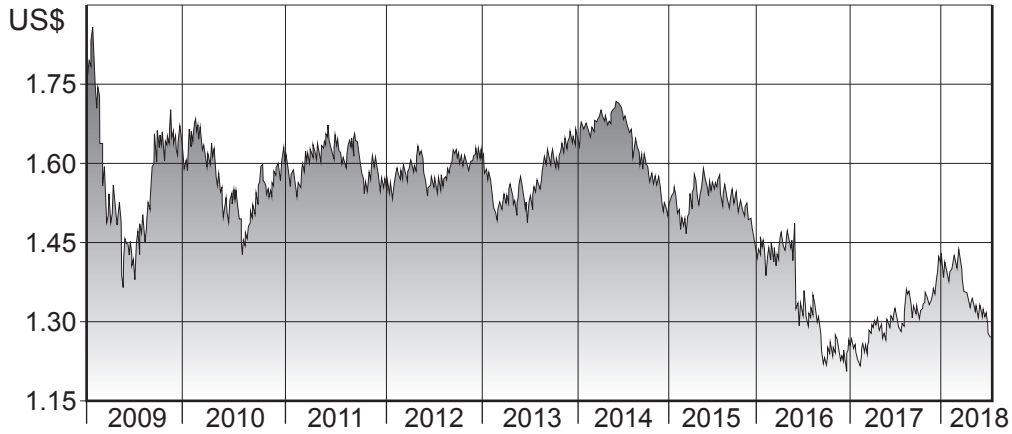


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Table 2

UK Economic indicators (Aug 18)	
Unemployment rate	4.1%
Inflation rate	2.5%
Quarterly GDP growth rate (Q2 2018)	0.1%

Figure 2: UK Pound (£) v US Dollar ($) from 2008 to August 2018



(a) (i) Using the data, explain how "raising interest rates by 50%" and "increasing interest rates by 0.25 percentage points" are the same thing. [2]

(ii) "Someone with a £5000 savings balance benefiting from a 0.25 percentage point rate increase will see their interest income rise by £1.04 per month." Show how this was calculated. [2]

(b) (i) Other than inflation, state **two** factors that the Monetary Policy Committee is likely to take into account when setting the bank rate. [2]

(ii) In addition to setting the bank rate, the Bank of England has many other roles. State **two** other roles of the Bank of England. [2]

(c) To what extent will increasing the bank rate affect the levels of consumption **and** investment in the UK? [10]

(d) With reference to the data and with the use of an exchange rate diagram, discuss whether interest rates are the main factor affecting exchange rates. [10]

(e) Using an AD/AS diagram, evaluate whether the use of demand-side policies always leads to a conflict of policy objectives. [12]

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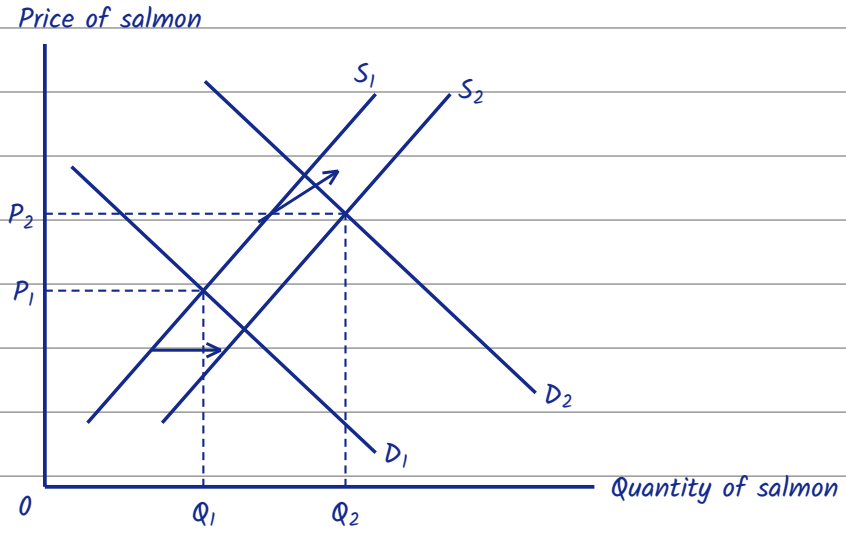
Surname	StemUp Model Solution
Answer booklet	Write the question number in the left-hand margin at the start of each answer.

Question number

1. (a) Scarcity is when there are finite (limited) resources but infinite (unlimited) wants, so not all wants can be met. E.g. by 2050 the world population will reach 9.7 billion and demand for protein will double, so food may become increasingly scarce (lines 1 to 2).

(b) Salmon is a normal good (positive income elasticity of demand), because 'consumers typically increase their spending on animal proteins such as salmon as their income increases' (lines 9 to 10).

(c) Demand for salmon has increased for several reasons. The growing world population (line 6) means more consumers, people are 'actively encouraged to consume more fish as part of a healthy and balanced diet' (line 7) so tastes have changed in favour of salmon, and since salmon is a normal good, 'an improving global economy' (line 10) raising incomes has 'further increased demand'. As the diagram shows, demand shifts right from D_1 to D_2.



At the same time 'total supply' has continued to rise (line 11), e.g. due to

Question number

improved productivity in salmon farming, so supply shifts right from S_1 to S_2. However, the increase in demand is greater than the increase in supply. At the original price P_1 there is excess demand, so the price is bid up until a new equilibrium is reached at P_2 and Q_2. Both quantity and price have risen: price rises from P_1 to P_2 because demand has grown by more than supply, which is why prices have been 'pushed upwards' (line 11).

(d) Price elasticity of supply (PES) measures the responsiveness of quantity supplied to a change in price: PES = %Δ quantity supplied ÷ %Δ price. Supply is price inelastic if a change in price causes a proportionally smaller change in quantity supplied ($0 < PES < 1$), and price elastic if it causes a proportionally larger change ($PES > 1$).

In the short run the supply of farmed salmon is likely to be price inelastic. Even if the price of salmon rises, farms cannot quickly raise output because of 'the 3-year production process' (line 18): salmon take three years to grow to market size, so extra fish bred now cannot be sold for years. Supply is also limited by 'regulations, and capacity constraints' (line 18): farms are limited in the number of pens and sites they have, licences for new marine sites are needed, and stocks cannot easily be stored, so quantity supplied responds little to price.

However, in the long run supply is likely to be price elastic. Given time, farmers can breed more fish, build new pens, gain licences and expand capacity, and 'improved productivity' should make supply 'price responsive' (lines 17 to 18). The PES may also vary from farm to farm and between countries depending on spare capacity. On the other hand, tighter environmental regulation, with almost one in five Scottish farms failing statutory standards (lines 28 to 29), may restrict new sites and keep supply inelastic even in the long run. Overall, supply is price inelastic in the short run and more elastic in the long run, as long as regulation allows expansion.

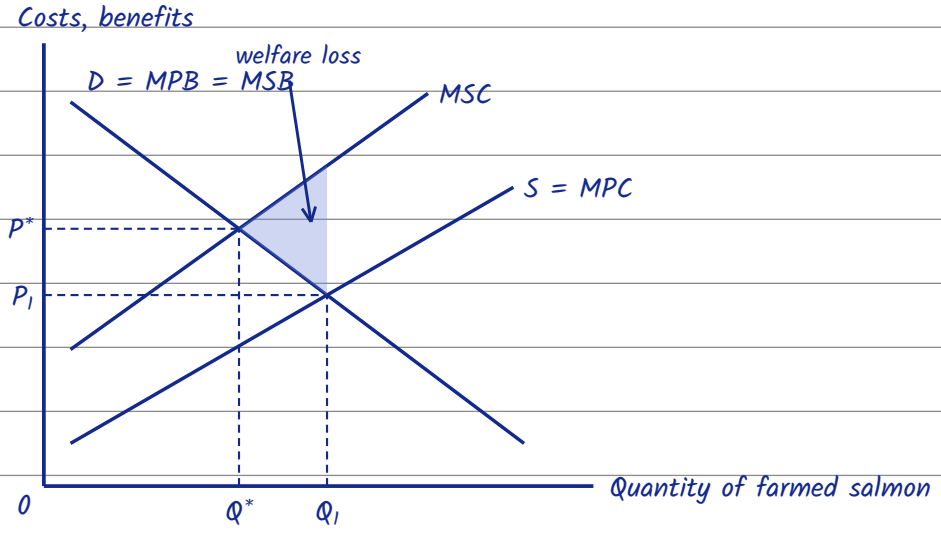
Question number

(e)

Market failure occurs when the free market leads to a misallocation of resources, so that social welfare is not maximised (allocative inefficiency). Forms include negative externalities, merit goods and information failure.

The main source of market failure is negative production externalities: costs imposed on third parties not involved in the transaction, which the producer does not pay for. Salmon farms spread disease and 'sea lice' to wild salmon (lines 22 to 24), and have been blamed for 'the decrease in wild salmon stocks' (line 21). Farmed salmon also eat wild fish, with up to 5 kg of wild fish used to produce 1 kg of farmed salmon (lines 25 to 26), depleting other fish stocks, and marine ecosystems face 'irrecoverable damage' (line 31). These external costs fall on wild fishermen, anglers, tourism and future generations, so marginal social cost (MSC) is greater than marginal private cost (MPC).

As the diagram shows, the free market produces at Q_1, where MPC = MPB, rather than at the social optimum Q^*, where MSC = MSB. Farmed salmon is over-produced and under-priced (P_1 instead of P^*), creating the shaded welfare loss.



There may also be information failure. Consumers may be unaware of the environmental damage caused by salmon farming, leading to over-consumption. However, salmon may be a merit good: it is 'a good source of high-quality protein, vitamins and minerals' (line 8), and healthier diets create positive

Question number

consumption externalities such as less strain on the NHS and higher worker productivity. Consumers may not fully appreciate these benefits, so salmon may be under-consumed, which works against over-production.

However, the extent of market failure is debatable. Compared with other proteins, salmon is eco-efficient: it uses 2 000 litres of water per kg against 15 400 for beef, and its carbon footprint of 0.6g per serving is lower than chicken (0.9), pork (1.3) and beef (5.9). If consumers switch from beef to salmon, total external costs could fall. External costs are also very hard to value in money terms, and 'no research has been done' (line 23) on effects on wild populations, so the size of the welfare loss is uncertain. Information failure about health benefits is partly closed by people being 'actively encouraged' to eat fish (line 7). Salmon farming also brings external benefits to local communities through 12 000 jobs (line 14) and regional multiplier effects.

Overall, salmon farming does lead to market failure through negative externalities, but the extent depends on how it is done: since four in five farms meet statutory standards (line 28), the failure comes mainly from poorly run farms, so regulation and fines rather than closure is the appropriate response.

(f) Closing all salmon farms would have a significant negative impact on the Scottish economy. Salmon farming is 'one of Scotland's most profitable industries' and provides 'over 12 000 jobs' (line 14). These workers would be made redundant, raising unemployment, and since many farms are in remote rural areas such as the Highlands and Islands with few other large employers, it would be hard to find new jobs.

There would also be a negative multiplier effect. Unemployed workers have lower incomes and cut their consumption, so local shops and services lose revenue, and firms in the supply chain such as feed suppliers, boat builders, processors and hauliers lose business. Each round of lost spending becomes

Question number	
	lost income for others, so the fall in Scottish national income is greater than the initial loss of output.
	Farmed Scottish salmon is 'the UK's biggest single food export' (line 15), so exports (X) would fall, worsening the UK current account balance. Lower exports, consumption and investment reduce aggregate demand (AD = C + I + G + X − M), so economic growth slows and average incomes and living standards fall. The government would also lose tax revenue from income tax and corporation tax on a profitable industry, while spending more on unemployment benefits, worsening the budget balance.
	However, the size of the impact may be limited. 12 000 jobs is small relative to Scotland's workforce of about 2.6 million, under 0.5%, so the national effect on unemployment and GDP may be small even if local effects are severe. The unemployment may be short term if workers are occupationally and geographically mobile, though in remote areas it may become long-term structural unemployment. New jobs could be created as marine ecosystems recover: wild salmon fishing, angling and eco-tourism are valuable to Scotland. With UK unemployment historically low (4.1% in 2018), there may be enough vacancies elsewhere to absorb workers. Other components of AD may change and offset the fall, ceteris paribus may not hold, and closure would remove negative externalities, improving long-run sustainability.
	On balance, closure would cause a large short-term fall in employment and income in rural communities, with a smaller effect on the Scottish economy as a whole. In the long run, the impact depends on the mobility of labour and whether alternative industries such as tourism grow, but given the export earnings lost, the overall impact would most likely be negative.
2. (a) (i)	The rate rose from 0.5% to 0.75%. 0.75 − 0.5 = 0.25 percentage points, and as a percentage change (0.25 ÷ 0.5) × 100 = 50%.
(a) (ii)	Extra interest per year = £5 000 × 0.25% = £5 000 × 0.0025 = £12.50. Per

Question number	
	month = £12.50 ÷ 12 = £1.04.
(b) (i)	1. The unemployment rate.
	2. The GDP growth rate (also the exchange rate or house prices).
(b) (ii)	1. Lender of last resort to the banks.
	2. Banker to the Government (also regulator of the financial system).
(c)	Consumption is household spending on goods and services; investment is spending by firms on capital goods. The bank rate is the rate the Bank of England charges commercial banks, which influences all other interest rates in the UK.
	Increasing the bank rate should reduce consumption. Saving becomes more rewarding, as a £5 000 balance earns £1.04 more per month, so the opportunity cost of spending rises and households save more and spend less.
	Borrowing becomes more expensive: the 3 million households on tracker mortgages see higher repayments, £26 more per month on a £200 000 mortgage (Table 1), leaving less discretionary income, and credit card and loan interest rises, reducing spending on credit such as cars and holidays. Higher rates may also reduce house prices, lowering household wealth and confidence.
	Investment should also fall. Firms often borrow to finance investment, so a higher interest rate raises the cost of borrowing and fewer projects have an expected return above that cost. Firms using retained profits also face a higher opportunity cost, since they could earn interest instead. With lower consumption, firms expect lower sales, reducing investment further (accelerator).
	However, the effect is likely to be small. The rise is only 0.25 percentage points, from 0.5% to 0.75%, still very low by historical standards (5.75% in 2008, Figure 1), and an extra £1.04 per month will barely change saving behaviour. With inflation at 2.5% (Table 2), the real interest rate is still

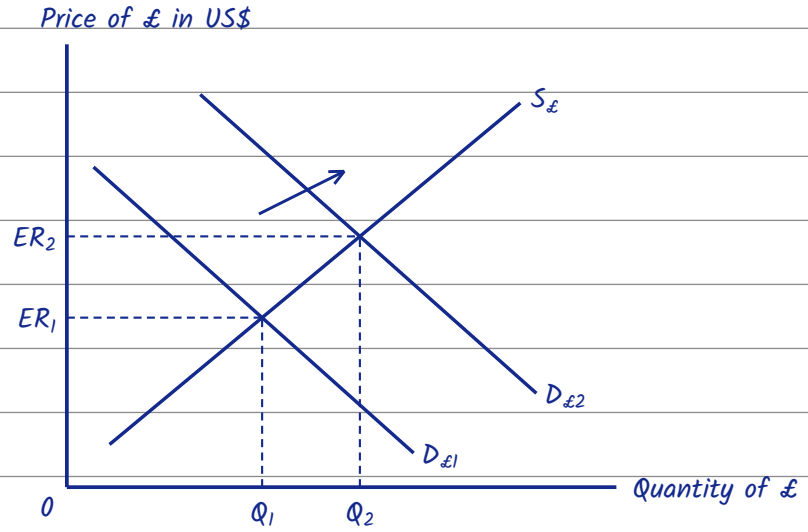
Question number

negative (0.75 – 2.5 = –1.75%), so savers are still losing money in real terms and saving is not attractive. Most UK mortgages are fixed rate, so only tracker borrowers are affected straight away, and commercial banks may not pass on the rise. Unemployment is low at 4.1%, so job security and confidence may keep households spending. Investment depends more on business confidence and expected demand than on a small change in interest rates; in 2018 Brexit uncertainty was a bigger influence. There are also time lags of 18 months to 2 years.

Overall, the rise will reduce consumption and investment slightly, with the largest effect on indebted households, but its impact is limited by its small size and negative real interest rates; it is more a signal of future rises.

(d) The exchange rate is the price of one currency in terms of another, e.g. £1 = $1.30, determined by the demand for and supply of the pound on the foreign exchange market.

Higher UK interest rates increase the return on saving in UK banks relative to other countries. This attracts 'hot money' inflows from foreign investors, who must buy pounds to deposit, so demand for the pound shifts right from $D_{£1}$ to $D_{£2}$. As the diagram shows, the exchange rate appreciates from ER_1 to ER_2. Conversely, falling interest rates cause a depreciation.



The data supports this to some extent. In 2008 to 2009 the bank rate was

Question number

cut from about 5% to 0.5% (Figure 1) and the pound fell from about $2.00 to below $1.40 (Figure 2). In 2016 the rate was cut to 0.25% and the pound fell to about $1.22.

However, interest rates were constant at 0.5% from 2009 to 2016, yet the pound fluctuated between about $1.45 and $1.71, so other factors must have mattered. After the rise in August 2018, the pound fell to about $1.30 rather than appreciating. The fall in 2016 was mainly due to political uncertainty after the Brexit referendum, which caused speculators to sell pounds, increasing supply. Speculation is the biggest driver of currency flows and depends on expectations of the economy, politics and 'animal spirits', not only interest rates. A small rise may already be expected and 'priced in'. Relative interest rates matter: US rates were rising faster in 2018, so the UK interest rate differential narrowed. Trade also matters: the UK is a net importer with a current account deficit, which increases the supply of pounds. Weak growth of 0.1% (Table 2) and inflation of 2.5%, above the 2% target, reduce confidence and competitiveness. The effect also depends on the elasticity of supply of the pound.

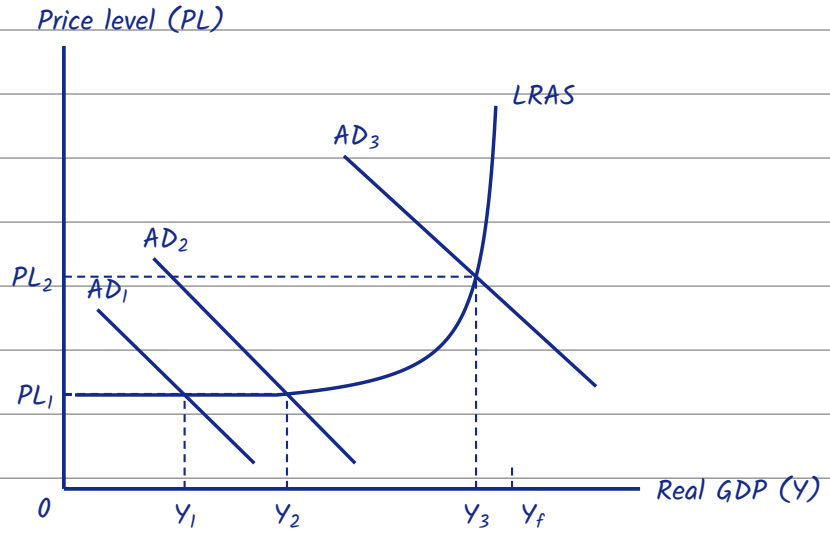
Overall, interest rates are an important factor, but the data shows that since 2016 political uncertainty and speculation over Brexit have been the main factor affecting the pound, outweighing the small interest rate change.

(e) Demand-side policies are policies whose main aim is to shift aggregate demand ($AD = C + I + G + X - M$), using fiscal policy (government spending and taxation) or monetary policy (interest rates, quantitative easing). The government's macroeconomic objectives include low and stable inflation (2% CPI target), low unemployment, steady economic growth, a sustainable current account balance, a balanced budget and protecting the environment. A conflict of policy objectives is when achieving one objective makes another worse.

Expansionary demand-side policy, e.g. cutting interest rates or increasing government spending, shifts AD right. As the diagram shows, a shift from

Question number

AD_2 to AD_3 near full capacity raises real GDP from Y_2 to Y_3, creating growth and reducing unemployment, but the price level rises from PL_1 to PL_2 because firms face shortages of labour and capacity and bid up costs. This is the trade-off between unemployment and inflation (Phillips curve). Higher incomes also increase spending on imports, worsening the current account, and higher inflation makes exports less price competitive. Fiscal expansion through higher spending or tax cuts also worsens the budget deficit, and more output can create pollution, conflicting with environmental objectives.



However, demand-side policies do not always lead to conflict. If the economy has large spare capacity, such as in a recession, AD shifts along the horizontal section of the Keynesian LRAS. As the diagram shows, a shift from AD_1 to AD_2 raises real GDP from Y_1 to Y_2 with no rise in the price level, so growth and lower unemployment are achieved without inflation. In August 2018, with UK GDP growth of only 0.1% a quarter (Table 2), some spare capacity may have existed.

Contractionary policy can also achieve objectives together: raising interest rates to reduce inflation may also reduce imports and improve the current account. Some demand-side spending, such as on infrastructure, education or training, also increases LRAS, so capacity rises with demand and inflation is avoided. Growth increases tax revenue and reduces benefit spending, so a short-run

Question number

deficit may be repaid in the long run. Environmental damage can be reduced by regulation or by spending on green investment.

Overall, demand-side policies do not always cause a conflict: it depends on the amount of spare capacity in the economy, the size of the AD shift and whether the policy also boosts LRAS. Close to full employment, such as the UK with unemployment at 4.1% in 2018, conflicts between growth, inflation and the current account are likely, so supply-side policies are needed alongside them.